

## **CAMBRIDGE CITY WATERWORKS SYSTEM IMPROVEMENTS CONTRACTS A & B WATER MAINS AND BOOSTER STATION, ELEVATED WATER STORAGE TANK**

### **Summary**

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- Work includes installation of approximately 980 feet of open-cut water main pipe, installation of approximately 280 feet of directionally drilled water main pipe, installation of a new booster station utilizing variable frequency drives (VFD) to operate the pumps, and construction of a new elevated water storage tank.
- Estimated loan amount = \$2,159,000
- **Total GPR Amount: \$92,000 (\$17, 200 for planning, design, and utility connections; \$74, 800 for construction). The entire GPR amount falls within the Energy Efficiency GPR category.**
- Estimated annual energy savings is 17% or approximately \$818.

### **Background**

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- The existing 150,000 gallon elevated water storage tank in Town was constructed in 1955 is undersized according to the Recommended Standards for Waterworks based on the Town's current average daily water consumption. A new 500,000 gallon elevated water storage tank will be constructed to replace the existing tank, which will be demolished.
- Erosion along the banks and bottom of the Whitewater River has exposed the top of an existing 6-inch water main along Main Street in Town. The main is currently functioning normally, however is exposed to weathering and hydraulic forces of the river. Further erosion may compromise the operability of the pipe and replacement of this main will be included with this project.
- Low pressure problems have been found in two areas of Town. The Mount Auburn area is experiencing low pressure problems and the State Road 1 and Delaware Street intersection is experiencing low pressure and flow problems. A water main loop will be constructed at the intersection of SR 1 and Delaware Street to raise the pressures and flow in this area. A new booster station pump utilizing VFD pumps will be installed provide additional flow and pressure to the Mount Auburn area. This was the only green portion of the project determined by SRF to be eligible for an interest rate reduction.

## Results

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### PRESENT WORTH COST ANALYSIS

	Capital Cost	Annual O & M Cost	Expected Life	Annual Replacement Cost	Present Worth	Differential
Variable Speed Motors	\$3,550	\$4,033	15	240.4	\$64,280	-\$11,511
Constant Speed Motors	\$2,790	\$4,851	15	242.2	\$75,792	

- Estimated cost savings over the life of the Variable (VFD) pumps will be \$11,511.
- The payback period is approximately 11 months.

### CALCULATED ENERGY EFFICIENCY IMPROVEMENTS

#### Energy Savings

Ratings	Variable kW	Constant kW	% Savings
Q MIN	0.059	0.082	28%
Q Normal	0.155	0.163	5%
Q Max	0.348	0.371	6%

## Conclusion

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- By installing VFD pumps in the new booster station serving the Mount Auburn area in Cambridge City, the pumps will have a total estimated energy savings of 17%.
- At 7.5 cents per kW, energy reductions from the new pumps utilizing VFD technology will save approximately \$818 annually.

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#### Referenced Materials –

Waterworks System Improvements Contracts “A & B” – Water Mains and Booster Station, Elevated Water Storage Tank Project, Town of Cambridge City, Indiana, Wessler Engineering, Dated September 28, 2010